

### Abstract

A method is disclosed for processing data to identify optimal solutions to a problem using a genetic algorithm. Multiple populations of data entries, referred to as solutions, are created and kept separate from each other. Solutions are rated based on their desirability. Solutions from one population are combined, or "cross-bred," with solutions from another population to create offspring solutions. The offspring of the cross-over are associated with one of the parent populations and rated. The most desirable solutions within a population are selected from the parent and offspring solutions to form the next generation of solutions. The remaining solutions may be discarded from the population. The cross-over and selection steps may then be repeated using second-generation solutions to create a third generation. The method may be implemented, for example, to design the layout of a circuit board. Diversity of solutions is increased by keeping the populations separate but allowing cross-breeding.